

(19) **KOREAN INTELLECTUAL PROPERTY OFFICE**

**KOREAN PATENT ABSTRACTS**

(11)Publication  
number:

**1020010095367**

**A**

(43)Date of publication of application:  
**07.11.2001**

(21)Application number: **1020000014903**

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(22)Date of filing: **23.03.2000**

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(30)Priority: ..

(51)Int. Cl. **C08F 220/52**

**(54) AMPHIPHILIC CROSSLINKED POLYMER NANO PARTICLE USED IN SOIL FLUSHING AS SURFACTANT**

**(57) Abstract:**

**PURPOSE:** An amphiphilic crosslinked copolymer, which is used as a surfactant in soil flushing technology, is provided to separate hydrophobic contaminants sorbed to the saturated soil matrix without resorption of surfactant exhausted to soil particles. The particle size of this surfactant is about 100 to 200 nano meters and it has thus a large contact area to contaminants. This surfactant can be collapsed even with a small amount of calcium chloride because the surfactant is a crosslinked-structure, thus use of the amphiphilic surfactant enables soil flushing technology not requiring additional facilities to recapture/treat operation of surfactant exhausted.

**CONSTITUTION:** The amphiphilic crosslinked copolymer is manufactured by emulsifier-free emulsion polymerization of compounds represented as chemical formula 1 in which after the compound(b) is first dissolved in aqueous solution, the compound (b) and (c) with initiator are added and then polymerized at 80deg.C for about 5 hrs as stirring with the speed of 200 rpm. In the chemical formula, A represents such cationic compounds as carboxy group and sulfone group that can form quaternary amines by

reaction with anion and acid; the compound(a) comprises one hydrophobic monomer selected from the group consisting of methyl methacrylate, styrene, glycidyl methyl methacrylate and butyl acrylate; the compound(b) comprises one selected from either the vinylamine group consisting of acrylamide, acryloyloxy trimethyl ammonium chloride, vinyl pyridine or the anion monomer group consisting of acrylic acid, styrene sulfonic acid sodium salt; the compound(c) comprises divinylbenzene with at least two double bonds polymerizable or crosslinking agent such as triethyleneglycol dimethacrylate.

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#### Legal Status

Date of request for an examination (20000323)

Notification date of refusal decision ( )

Final disposal of an application (rejection)

Date of final disposal of an application (20030902)

Patent registration number ( )

Date of registration ( )

Number of opposition against the grant of a patent ( )

Date of opposition against the grant of a patent ( )

Number of trial against decision to refuse ( )

Date of requesting trial against decision to refuse ( )

Date of extinction of right ( )